WHAT IS CLAIMED IS:

1. A method for controlling a micro-electromechanical system (MEMS), said method comprising:

providing a rotatable mirror with an optical sensor that is in electrical communication with said rotatable mirror via an associated electrode;

supplying electrical potential to said optical sensor, wherein said optical sensor is configured to provide a variable range of voltages to said rotatable mirror;

directing an optical control beam onto said optical sensor, wherein said optical sensor determines optical characteristics of said optical control beam;

responsively supplying voltage to said rotatable mirror, wherein an amount of said supplied voltage is based on the determined optical characteristics of said optical control beam; and

rotating said rotatable mirror about a primary axis in response to said supplied voltage to said rotatable mirror.

2. The method according to claim 1, said method further comprising:

controlling an angle of rotation of said rotatable mirror about said primary axis by modifying the optical characteristics of said optical control beam.

3. The method according to claim 1, said method further comprising:

controlling an angle of rotation of said rotatable mirror about said primary axis by modifying an optical wavelength of said optical control beam.

4. The method according to claim 1, said method further comprising:

controlling an angle of rotation of said rotatable mirror about said primary axis by modifying a light intensity of said optical control beam.

5. The method according to claim 1, said method further comprising:

providing said rotatable mirror with a plurality of optical sensors that are in electrical communication with said rotatable mirror via separate electrodes, wherein a first and second optical sensor, of said plurality of optical sensors, are associated with rotating said rotatable mirror about respective primary and secondary axes;

supplying electrical potential to each of said plurality of optical sensors, wherein each of said plurality of optical sensors are configured to provide a variable range of voltages to said rotatable mirror;

directing a first optical control beam onto said first optical sensor, and directing a second optical control beam onto said second optical sensor, wherein said first and second optical sensors respectively determine optical characteristics of said first and second optical control beams;

responsively supplying voltage to said rotatable mirror, wherein an amount of said supplied voltage is based on the respectively determined optical characteristics of said first and second optical control beams; and

rotating said rotatable mirror about said primary and secondary axes in response to voltage respectively supplied by said first and second optical sensors.

6. The method according to claim 5, said method further comprising:

controlling respective angles of rotation of said rotatable mirror about said primary and secondary axes by modifying the respective optical characteristics of said first and second optical control beams.

7. The method according to claim 5, wherein said primary and secondary axes are perpendicular.

8. The method according to claim 1, wherein said micro-electromechanical system (MEMS) is used in an optical cross connect switch.

9. The method according to claim 1, wherein said optical control beam is generated by a light source selected from the group consisting of a light emitting diode (LED), an optical fiber, a laser, and a vertical cavity surface emitting laser (VCSEL).

10. The method according to claim 1, said method further comprising:

controlling an angle of rotation of said rotatable mirror about said primary axis by modifying at least one optical characteristic of said optical control beam, wherein said at least one optical characteristic is selected from the group consisting of optical wavelength, light intensity, position, polarization, and duty cycle.

11. A method for controlling a micro-electromechanical system (MEMS), said method comprising:

providing a plurality of rotatable mirrors to form a MEMS array, wherein each of said plurality of rotatable mirrors includes an associated optical sensor;

supplying electrical potential to each of said plurality of optical sensors, wherein each one of said plurality of optical sensors is configured to provide a variable range of voltages to an associated rotatable mirror;

directing an optical control beam onto a first optical sensor, which is one of said plurality of optical sensors, wherein said first optical sensor determines optical characteristics of said optical control beam;

responsively supplying voltage to a rotatable mirror that is associated with said first optical sensor, wherein an amount of said supplied voltage is based on the determined optical characteristics of said optical control beam; and

rotating said rotatable mirror that is associated with said first optical sensor about a primary axis in response to said supplied voltage.

12. The method according to claim 11, said method further comprising:

controlling an angle of rotation of said rotatable mirror that is associated with said first optical sensor about said primary axis by modifying the optical characteristics of said optical control beam.

13. The method according to claim 11, said method further comprising:

supplying electrical potential to each of said plurality of optical sensors via a common electrical lead.

14. The method according to claim 11, said method further comprising:

supplying electrical potential to each of said plurality of optical sensors via a number of electrical leads, wherein the number of electrical leads is less than a number of said plurality of optical sensors.

15. The method according to claim 11, said method further comprising:

supplying electrical potential to each of said plurality of optical sensors via a number of electrical leads, wherein the number of electrical leads is less than a number of said plurality of rotatable mirrors that form said MEMS array.

16. A method for controlling a micro-electromechanical system (MEMS), said method comprising:

providing a plurality of rotatable mirrors having a plurality of associated optical sensors, wherein a first and second optical sensor of each of said plurality of associated optical sensors enable rotation of an associated rotatable mirror about respective primary and secondary axes;

supplying electrical potential to each of said plurality of associated optical sensors, wherein each of said plurality of associated optical sensors are configured to provide a variable range of voltages to an associated rotatable mirror;

directing first and second optical control beams onto respective first and second optical sensors, wherein said first and second optical sensors respectively determine optical characteristics of said first and second optical control beams;

responsively supplying voltage to a rotatable mirror that is associated with said first and second optical sensors, wherein an amount of said supplied voltage is based on the respectively determined optical characteristics of said first and second optical control beams; and

rotating said rotatable mirror that is associated with said first and second optical sensors about a primary and secondary axes in response to voltage respectively supplied by said first and second optical sensors.

17. The method according to claim 16, said method further comprising:

controlling respective angles of rotation about said primary and secondary

axes by modifying the respective optical characteristics of said first and second optical control beams.

18. The method according to claim 16, said method further comprising:

supplying electrical potential to each of said plurality of associated optical sensors via a common electrical lead.

19. The method according to claim 16, said method further comprising:

supplying electrical potential to each of said plurality of associated optical sensors via a number of electrical leads, wherein the number of electrical leads is less than a number of said plurality of associated optical sensors.

20. The method according to claim 16, said method further comprising:

supplying electrical potential to each of said plurality of associated optical sensors via a number of electrical leads, wherein the number of electrical leads is less than a number of said plurality of rotatable mirrors.

21. The method according to claim 16, wherein said micro-electromechanical system (MEMS) is used in an optical cross connect switch.

22. An optically controlled micro-electromechanical system (MEMS), said MEMS comprising:

a rotatable mirror having an optical sensor that is in electrical communication with said rotatable mirror via an associated electrode;

an electrical lead that supplies electrical potential to said optical sensor;

an optical controller for directing an optical control beam onto said optical sensor, wherein said optical sensor determines optical characteristics of said optical control beam; and

a voltage controller that is configured with said optical sensor, wherein said voltage controller responsively supplies voltage to said rotatable mirror based on the determined optical characteristics of said optical control beam, causing said rotatable mirror to rotate about out a primary axis in response to voltage supplied by said voltage controller.

23. The micro-electromechanical system (MEMS) according to claim 22, wherein said optical controller modifies the optical characteristics of said optical control beam to control an angle of rotation of said rotatable mirror about said primary axis.

24. The micro-electromechanical system (MEMS) according to claim 22, wherein said optical controller modifies an optical wavelength of said optical control beam to control an angle of rotation of said rotatable mirror about said primary axis.

25. The micro-electromechanical system (MEMS) according to claim 22, wherein said optical controller modifies a light intensity of said optical control beam to control an angle of rotation of said rotatable mirror about said primary axis.

26. The micro-electromechanical system (MEMS) according to claim 22, wherein said optical control beam is generated by a light source selected from the group consisting of a light emitting diode (LED), an optical fiber, a laser, and a vertical cavity surface emitting laser (VCSEL).

27. The micro-electromechanical system (MEMS) according to claim 22, wherein said optical controller modifies at least one optical characteristic of said optical control beam to control an angle of rotation of said rotatable mirror about said primary axis, wherein said at least one optical characteristic is selected from the group consisting of optical wavelength, light intensity, position, polarization, and duty cycle.

28. An optically controlled micro-electromechanical system (MEMS), said MEMS comprising:

a rotatable mirror having a plurality of optical sensors that are in electrical communication with said rotatable mirror via separate electrodes, wherein a first and second optical sensor, of said plurality of optical sensors, are associated with rotating said rotatable mirror about respective primary and secondary axes;

at least one electrical lead that supplies electrical potential to each of said plurality of optical sensors;

an optical controller for directing first and second optical control beams onto respective first and second optical sensors, wherein said first and second optical sensors respectively determine optical characteristics of said first and second optical control beams; and

a voltage controller that is configured with said optical sensor, wherein said voltage controller responsively supplies voltage to said rotatable mirror based on the respectively determined optical characteristics of said first and second optical control beams, causing said rotatable mirror to rotate about said primary and secondary axes.

29. The micro-electromechanical system (MEMS) according to claim 28, wherein said optical controller modifies the optical characteristics of said first and second optical control beams to control respective angles of rotation of said rotatable mirror about said primary and secondary axes.

30. An optically controlled micro-electromechanical system (MEMS), said MEMS comprising:

a plurality of rotatable mirrors having a plurality of associated optical sensors, wherein a first and second optical sensor, of each of said plurality of associated optical sensors, enable rotation of an associated rotatable mirror about respective primary and secondary axes;

at least one power lead that supplies electrical potential to each of said plurality of associated optical sensors;

an optical controller for directing first and second optical control beams onto respective first and second optical sensors, wherein said first and second optical sensors respectively determine optical characteristics of said first and second optical control beams; and

a separate voltage controller that is configured with each of said plurality of associated optical sensors, wherein said separate voltage controller responsively supplies voltage to an associated rotatable mirror based on the respectively determined optical characteristics of said first and second optical control beams, causing said rotatable mirror to rotate about said primary and secondary axes.

31. The micro-electromechanical system (MEMS) according to claim 30, wherein said optical controller modifies the optical characteristics of said first and second optical control beams to control respective angles of rotation of said rotatable mirror about said primary and secondary axes.

32. The micro-electromechanical system (MEMS) according to claim 30, wherein said electrical potential is supplied to each of said plurality of associated optical sensors via a common electrical lead.

33. The micro-electromechanical system (MEMS) according to claim 30, wherein said electrical potential is supplied to each of said plurality of associated optical sensors via a number of electrical leads, wherein the number of electrical leads is less than a number of said plurality of associated optical sensors.

34. The micro-electromechanical system (MEMS) according to claim 30, wherein said electrical potential is supplied to each of said plurality of associated optical sensors via a number of electrical leads, wherein the number of electrical leads is less than a number of said plurality of rotatable mirrors.

35. An optical cross connect switch utilizing an optically controlled micro-electromechanical system (MEMS), said switch comprising:

a fiber optic switch beam generating element that generates a communication light beam;

a fiber optic switch beam receiving element that receives said communication light beam from said fiber optic switch beam generating element at one of an array of output fibers;

a MEMS device for directing said communication light beam from said fiber optic switch beam generating element to a particular output fiber of said beam receiving element, wherein said MEMS device comprises:

a rotatable mirror having an optical sensor that is in electrical communication with said rotatable mirror via an associated electrode;

an electrical lead that supplies electrical potential to said optical sensor;

an optical controller for directing an optical control beam onto said optical sensor, wherein said optical sensor determines optical characteristics of said optical control beam; and

a voltage controller that is configured with said optical sensor, wherein said voltage controller responsively supplies voltage to said rotatable mirror based on the determined optical characteristics of said optical control beam, causing said rotatable mirror to rotate about out a primary axis in response to said supplied voltage;

wherein said optical controller controls which particular output fiber

that said communication beam is directed by modifying the optical

2 characteristics of said optical control beam.